American Fern Journal 77(1):16–27 (1987)

Notes on ×*Pleopodium* and *Pleopeltis* in Tropical America

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Interpretation of the polypodioid ferns has been a classic problem for pteridologists. The groupings are, with some exceptions, fairly clear, but whether they should be treated as subgenera of *Polypodium* or as distinct genera is a matter of considerable disagreement. There seems to be growing acceptance of their recognition as distinct genera (Smith 1981, 1985; Tryon & Tryon, 1982; Lellinger, 1985; Mickel & Beitel, in press), although some authors continue to recognize *Polypodium* in a broad sense (Proctor, 1977, 1985; Stolze, 1981).

Some of the splinter genera in America (e.g., *Campyloneurum, Niphidium*) stand well apart from *Polypodium* s.s., but others are apparently very closely allied to *Polypodium*. This is especially so in regard to *Pleopeltis*, some members of which hybridize with species of *Polypodium* s.s. The best known example of this is *Polypodium* ×*leucosporum* (=*Polypodium lanceolatum* × *P. thyssanolepis*), which was pointed out by Vareschi (1969) and described in detail by Wagner and Wagner (1975), who treated it and its parents within *Polypodium*. Recently, Anthony and Schelpe (1985) described a similar case in southern Africa, in which *Pleopeltis macrocarpa* (Bory ex Willd.) Kaulf. (=*Polypodium lanceolatum*) crosses with *Polypodium polypodioides* var. *ecklonii* (Kunze) Schelpe. The authors gave a hybrid intergeneric name to their hybrid species, ×*Pleopodium simianum* Anthony & Schelpe.

In our studies on the ferns of Oaxaca, Mexico (in press), we have seen specimens from various parts of Mexico that involve several members of these two genera. Most of the hybrids have binomials under *Polypodium*. The purpose of this paper is to make several new combinations under ×*Pleopodium* and *Pleopeltis*, and to clarify the putative parentage of the hybrids.

1. ×**Pleopodium leucosporum** (Klotzsch) Mickel & Beitel, comb. nov.—*Polypodium leucosporum* Klotzsch, Linnaea 20:404. 1847.—*Pleopeltis leucospora* (Klotzsch) Moore, Index Fil. 77. 1857.—*Lepicystis leucospora* (Klotzsch) Diels, in Engler & Prantl, Natur. Pflanz. 1(4):324. 1899.—TYPE: Venezuela ["Colombia"], *Moritz 306* (B!; isotype NY!).

Hybrid between *Pleopeltis macrocarpa* (Bory ex Willd.) Kaulf. (*Polypodium lanceolatum* L.) and *Polypodium thyssanolepis* A. Br.

Distribution.—Costa Rica, Colombia, Venezuela, Hispaniola.

Discussion.—Wagner and Wagner (1975) studied this hybrid in considerable detail. This combination is especially complicated since both parents have diploid and tetraploid races (Evans, 1963; Wagner & Wagner, 1975; Walker, 1966, 1973), resulting in theory in at least four types of crosses: diploid *Pl. macrocarpa* with two cytotypes of *P. thyssanolepis* and tetraploid *Pl. macrocarpa* with two

TABLE 1. Comparison of ×*Pleopodium leucosporum* and its Parents.

	macrocarpa	*leucosporum*	*thyssanolepis*
Blade	simple	irregularly lobed	pinnatifid
Rhizome scales	erose	fimbriate	fimbriate
Veins	pleopeltid	intermediate	goniophlebioid
Blade scales	round, 0.3–0.4 mm diam.	intermediate	lanceolate, 0.6–1.5 mm long, with elongate tip
	over 1 mm apart	intermediate	close to overlapping
Soral scales	black-centered	lacking	lacking
Spores	normal	abortive	normal

cytotypes of *P. thyssanolepis*. All of these hybrids have abortive spores but differ in the contributions of the two parents, explaining the considerable variation of this hybrid (Wagner & Wagner, 1975; Table 1).

Polypodium thyssanolepis is quite common in Mexico, but there does not seem to be any true *Pleopeltis macrocarpa* in Mexico, at least in Oaxaca and north. (*Pleopeltis macrocarpa* is distinguished by a combination of characters: black-centered soral scales, scattered fimbriate laminar scales, and black-centered, non-comose rhizome scales with conspicuous lumina.) Rather, Weatherby's (1922) varieties (our species) take its place and most of them are involved in crosses with species of *Polypodium*.

2. ×**Pleopodium tricholepis** Mickel & Beitel, hybr. nov. (Fig. 1C–E).—TYPE: Mexico, Oaxaca, Distrito Etla-Cuicatlán, 39 km N of Rte 190 past Telixtlahuaca, mixed oak-juniper forest along stream banks, 6200′, 8 Oct 1969, *Mickel 3873* (NY!; isotype UC!).

Planta inter *Pleopeltim mexicanam* et *Polypodium thyssanolepidem* hybrida a parentibus frondium divisione intermedia et sporis abortivis differt. [Gr., *thrix*, hair, and *lepis*, scale, referring to the ciliate (comose) scales and also a combination of the parental species epithets (*Polypodium trichophora* = *Pleopeltis mexicana*)].

Rhizome creeping, 1.5–2 mm diam.; rhizome scales deeply fimbriate, dimorphic; rhizome scales 1.5–2 mm long, bicolorous with brown-black center and narrow pale brown margin, occasionally with long brown hairs from central point; scales at base of stipe 2–3 mm long, pale brown with or without short dark central streak; fronds distant to nearly clumped; stipe ca. ½ of frond length, castaneous to atropurpureous, densely clothed with bicolorous scales, reddish brown with pale brown laciniate margin, round (0.5–0.8 mm wide) to lanceolate (1.5–2 mm long); blade irregularly pinnatisect, 16–18 cm long, 5–6 cm wide, broadest at base; pinnae or lobes 4–6 pairs, 5–7 mm wide; abaxial surface with scattered to dense, deeply fimbriate scales, mostly lanceolate (1.0–1.5 mm long), some round (0.8–1.0 mm wide), with brown center grading to whitish margin; midrib dark with lanceolate scales, 1.5–2 mm long; adaxial surface with sparse, deeply lacerate, lanceolate scales; sori round to slightly ovate, surrounded by

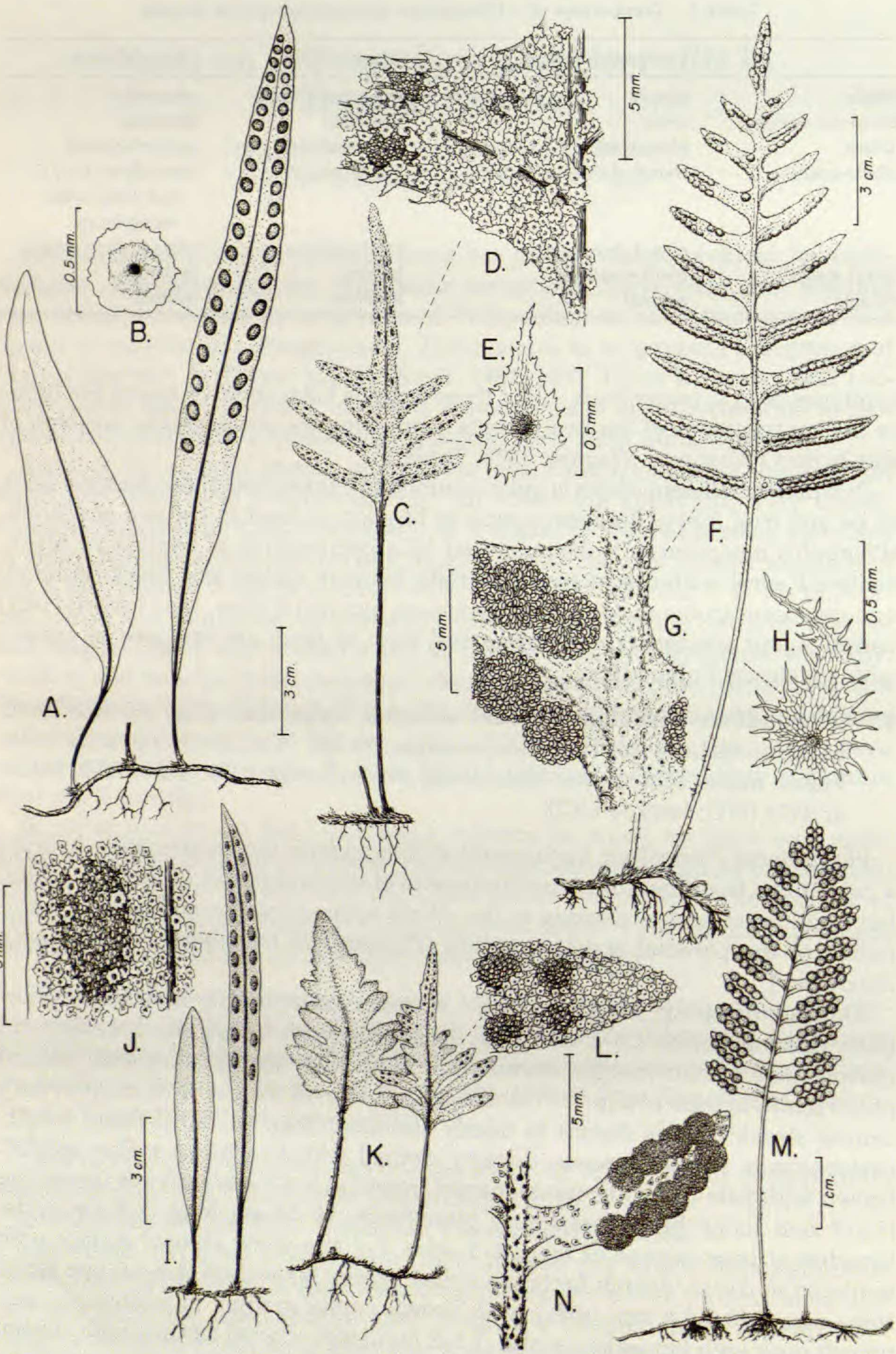
A.
B.
0.5 mm.
C.
3 cm.
D.
5 mm.
E.
0.5 mm.
F.
3 cm.
G.
5 mm
H.
0.5 mm.
I.
3 cm.
J.
5 mm
K.
L.
M.
1 cm.
N.
5mm.

TABLE 2. Comparison of ×*Pleopodium tricholepis* and its Parents.

	mexicana	*tricholepis*	*thyssanolepis*
Blade	simple	irregularly lobed	pinnatifid
Rhizome scales	dimorphic	dimorphic	monomorphic
	densely comose	occasionally comose	non-comose
	margin denticulate	fimbriate	fimbriate
	0.8–1 mm long (1.5–2 mm at stipe base)	1.5–2 mm long (2–3 mm at stipe base)	3–4 mm long
Stipe	flattened	slightly flattened	terete
Abaxial laminar scales	sparse	scattered to dense	dense
	round, 0.3–0.5 mm diam.	some round, mostly lanceolate, 1–1.5 mm long	lanceolate, 0.6–1.5 mm long
Hydathodes	lacking	present	present
Soral scales	present, round, erose	rare, lanceolate, fimbriate	lacking
Spores	normal	abortive	normal

laminar scales; soral scales rare, peltate to cordate, lanceolate, 0.8 mm long with pale brown point of attachment and lighter brown fimbriate margin; spores abortive.

Distribution.—Epiphytic in oak-juniper woods. Known only from the type collection.

Discussion.—This specimen, exhibiting hybrid characters of abortive spores and irregular blade lobes, appears to represent a hybrid between the pinnatisect species *Polypodium thyssanolepis* (Fig. 1F–H) and a simple-bladed species of *Pleopeltis* (see Table 2). Although *P. conzattii* was the only species of *Pleopeltis* found at the same locality, the presence of round scales and the absence of black-centered rachis scales makes that species unlikely as a possible parent. The few soral scales are not strongly and deeply bicolorous as one would expect in hybrids involving *P. polylepis*, *P. crassinervata*, *P. astrolepis*, and *P. interjecta*. *Pleopeltis mexicana* (Fig. 1A, B), with lightly colored soral scales, long stipe, and occasional tufts of long hairs on the rhizome scales, is probably the other parent.

Another specimen (Mexico, DF, Angostura, 2600 m, *Lyonnet 3414*, US) has rhizome scales monomorphic and larger (2–2.5 mm long vs. 1.5–2), blade scales darker, farther apart (sparse), and smaller (0.8–1 mm long vs. 1–1.5), pinna pairs

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FIG. 1. Hybrids of ×*Pleopodium* and their putative parents. A, B. *Pleopeltis mexicana* (*Mickel 4357*, NY, Oaxaca). A. Habit. B. Abaxial blade scale. C–E. ×*Pleopodium tricholepis* (*Mickel 3873*, NY, holotype). C. Habit. D. Abaxial blade detail. E. Abaxial blade scale. F–H. *Polypodium thyssanolepis* (*Mickel 7065*, NY, Oaxaca). F. Habit. G. Abaxial blade detail. H. Abaxial blade scale. I, J. *Pleopeltis polylepis* (*Mickel 7065*, NY, Oaxaca). I. Habit. J. Abaxial blade detail. K, L. ×*Pleopodium bartlettii* (*Bartlett 10286*, US, holotype). K. Habit. L. Abaxial blade detail. M, N. *Polypodium polypodioides* var. *aciculare* (*Mickel 1019*, NY, Oaxaca). M. Habit. N. Abaxial blade detail.

TABLE 3. Comparison of ×*Pleopodium bartlettii* and its Parents.

	polylepis	*bartlettii*	*polypodioides*
Blade	simple	irregularly lobed	pinnatifid
Rhizome scales	rarely comose	non-comose	non-comose
Laminar scales:			
Abaxial	round dark red-center 0.5–1 mm diam.	round & lanceolate red-brown center 0.1–0.3 mm diam.	round & lanceolate dark brown center 0.1–0.3 mm diam. or 0.4–0.6 mm long
Adaxial	round, erose	round base with long tip, some round	minute base with long tip
Soral scales	round	round	lacking
Spores	37–45 μm (42.2)	37–42 μm (38.5)	37–42 μm (39.7)

fewer, and soral scales dark-centered (vs. pale brown-centered). Tentatively we consider it as a variant of ×*P. tricholepis*, but conceivably it may represent the hybrid of *Pleopeltis interjecta* × *Polypodium thyssanolepis*.

3. ×**Pleopodium bartlettii** (Weath.) Mickel & Beitel, comb. et stat. nov. (Fig. 1K, L).—*Polypodium bartlettii* Weath. (pro sp.), Amer. Fern J. 25:56. 1935.—TYPE: Mexico, Tamaulipas, vicinity of San José, on tree trunks, *Bartlett 10286* (US!; isotype fragment GH!).

Hybrid between *Pleopeltis polylepis* (Roemer ex Kunze) Moore (Fig. 1I, J) and *Polypodium polypodioides* (L.) Watt (Fig. 1M, N) (Table 3), as suggested by Weatherby (1935), who noted similarities with *P. leucosporum*; he also thought it might be an odd form of *P. lanceolatum*. Reproductive status unknown.

Distribution.—Known only from the type collection.

4. ×**Pleopodium fallacissimum** (Maxon) Mickel & Beitel, comb. et stat. nov. (Fig. 2F, G).—*Polypodium fallacissimum* Maxon (pro sp.), Contr. U.S. Natl. Herb. 17:567. 1916.—TYPE: Mexico, Coahuila, San Lorenzo Canyon, 6 mi SE of Saltillo, *Palmer 426* (US!; isotype NY!).

Hybrid between *Pleopeltis erythrolepis* (Weath.) Pic. Ser. (Fig. 2B–E) and *Polypodium guttatum* Maxon (Fig. 2H–J) (see Table 4), as suggested by Thomas Wendt [note on paratype at US and pers. comm. as *polylepis* ×*guttatum*; he considered *erythrolepis* as a variety of *polylepis* (Wendt, 1980)]. Reproductive status unknown.

Distribution.—Southern Coahuila.

Discussion.—The paratype, *Palmer 425*, is smaller and less lobed, and is probably just a smaller form of *Pleopeltis fallacissimum*. *Heteroneuron paradoxum* Fée was cited by Fournier as a synonym of *Polypodium thyssanolepis*, but Maxon suggested it might be *Polypodium fallacissimum*. It is difficult to determine with certainty from Fée's illustration (Mém. foug. 6:3, pl. 1, f. 4. 1854). On general form it looks as if it might be a dwarf form of *P. thyssanolepis*, but in the

description Fée says there are scales among the sporangia, suggesting that *Pleopeltis* is involved.

In our work on Oaxacan pteridophytes (in press), we are treating the traditional varieties of *Polypodium lanceolatum* (*Pleopeltis macrocarpa*) as distinct species, necessitating two new combinations under *Pleopeltis*.

Pleopeltis interjecta (Weath.) Mickel & Beitel, comb. nov.—*Polypodium peltatum* Cav. var. *interjectum* Weath., Amer. Fern J. 34:17. 1944.—*Pleopeltis macrocarpa* var. *interjecta* (Weath.) A. R. Smith, Amer. Fern J. 70:26. 1980.—TYPE: Guatemala, Chimaltenango, 2700 m, *Standley 60957* (F).

Pleopeltis mexicana (Fée) Mickel & Beitel, comb. nov. (Fig. 1A, B).—*Drynaria mexicana* Fée, Mém. foug. 8:97. 1857.—SYNTYPES: Mexico. Veracruz, *Galeotti 6321*; Puebla, *Schaffner 179*; Popocatepetl, *Schaffner 292* (P?).

Polypodium lanceolatum L. var. *trichophorum* Weath., Contr. Gray Herb. 65: 8. 1922.—TYPE: Mexico, lava fields near Eslaba, 8000′, *Pringle 11797* (GH!; isotype US!).

The type of *Pleopeltis* (*Pl. angusta*) is pinnate, but as commonly construed the genus is comprised mostly of species with undivided fronds. The genus is distinguished by its peltate scales in the sorus. *Polypodium* (*Pleopeltis*) *percussum* Cav. seems to lack them, even in the very young sori, and might better be considered a *Microgramma*. Conversely, some species often treated as *Pleopeltis* have peltate soral scales, but in other respects seem disparate, e.g., *Pleopeltis munchii* (Christ) A. R. Smith.

One species usually treated as a *Polypodium*, *P. fallax*, has peltate soral scales, and therefore we are placing it in *Pleopeltis*. Another interesting feature of this species is its comose rhizome scales, which are present in nearly all species of *Pleopeltis* in Mexico. Such scales are also common in *Pecluma* and only occasionally in *Polypodium*, e.g., *P. adelphum* Maxon.

Pleopeltis fallax (Schlecht. & Cham.) Mickel & Beitel, comb. nov. (Fig. 2S–U).—*Polypodium fallax* Schlecht. & Cham., Linnaea 5:609. 1830.—TYPE: Mexico, [Veracruz], Misantla, *Schiede & Deppe 758* (B!, photo BM!; isotype LE!).

Pleopeltis fallax apparently hybridizes with two other species of *Pleopeltis*. (If *Pl. fallax* is maintained in *Polypodium*, then these hybrids would fall into ×*Pleopodium*.)

Pleopeltis ×sordidula (Maxon & Weath. in Weath.) Mickel & Beitel, comb. et stat. nov. (Fig. 2P–R).—*Polypodium sordidulum* Maxon & Weath. in Weath. (pro sp.), Amer. Fern J. 17:92. 1927.—TYPE: Mexico, Veracruz, epiphytic in coffee trees near Cordoba, *Spence 114* (GH!; isotype US!).

Since the original description of this species included both this and the following hybrid, we are redescribing *Pl.* ×*sordidula* [hybrid between *Pleopeltis astrolepis* (Liebm.) Fourn. (Fig. 2L–O) and *Pl. fallax* (Fig. 2S–U)] here in a more restricted sense.

Rhizome creeping, 0.5–0.8 mm diam.; rhizome scales 0.1–0.3 mm diam., round,

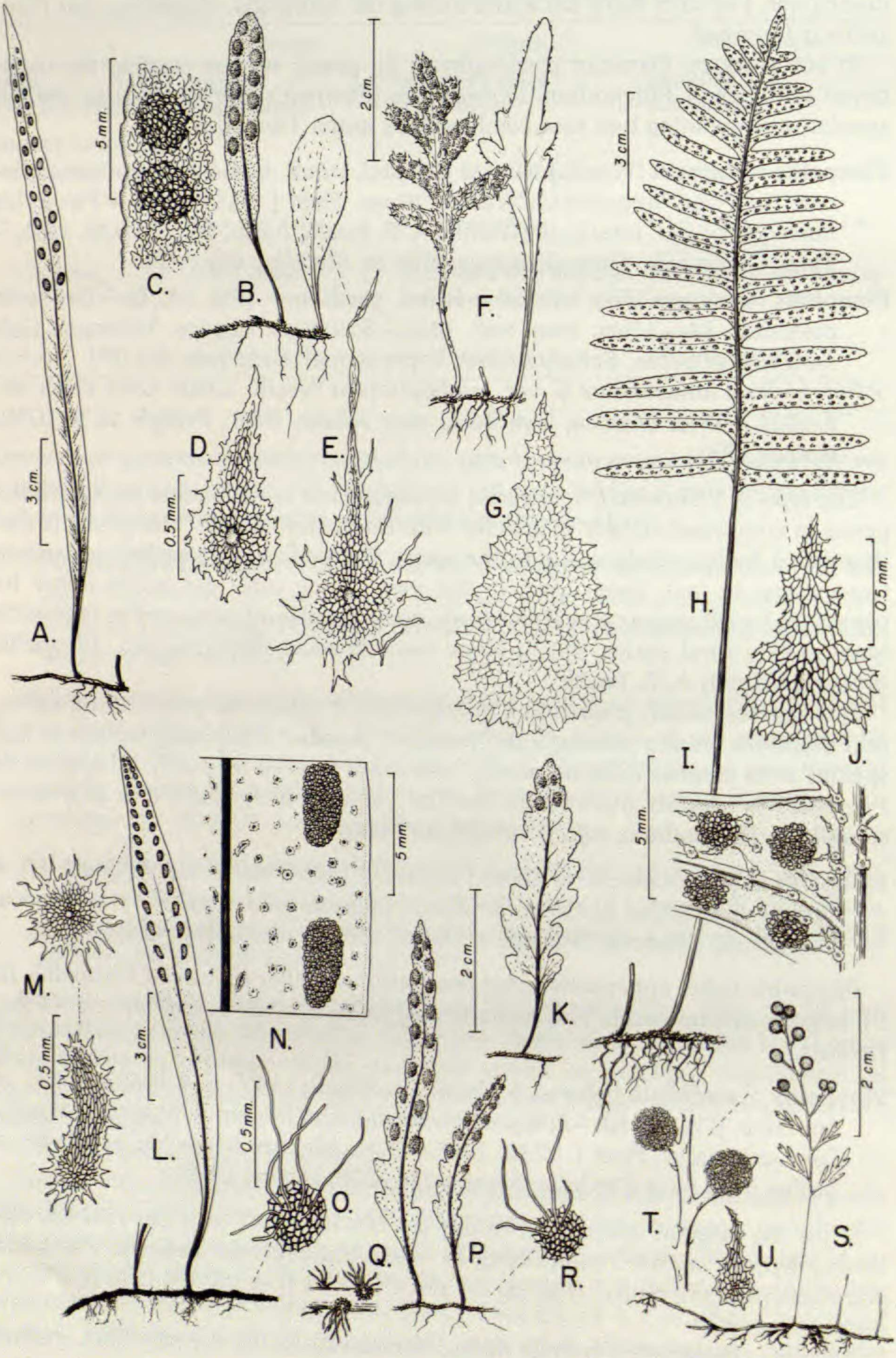
A.
3 cm.
B.
C.
5 mm.
D.
0.5 mm.
E.
2 cm.
F.
G.
H.
3 cm.
I.
J.
0.5 mm.
K.
2 cm.
L.
3 cm.
0.5 mm.
M.
N.
5 mm.
O.
0.5 mm.
P.
Q.
R.
S.
2 cm.
T.
U.
5 mm.

TABLE 4. Comparison of ×*Pleopodium fallacissimum* and its Parents.

	erythrolepis	*fallacissimum*	*guttatum*
Blade	simple	irregularly lobed	pinnatifid
Rhizome scales	margin cells lengthwise	margin cells toward margin	margin cells toward margin
	sclerotic	sclerotic-clathrate	sclerotic-clathrate
	comose	non-comose	non-comose
Stipe	flattened	flattened	terete
Laminar scales:			
Abaxial	dense	sparse to scattered	sparse
	round & lanceolate	deltate-ovate	deltate-ovate
	non-clathrate	subclathrate	clathrate
	emarginate	marginate	marginate
	brown center	dark only at attachment	no dark center
Adaxial	linear-lanceolate	lanceolate	lacking
	fimbriate	denticulate	
	dark center	no dark center	
Hydathodes	lacking	present	present
"Stretch marks" (epidermal lines)	present	present	lacking
Soral scales	frequent	rare	lacking
	dark brown center	clathrate center	
	brown to light brown margin	light brown margin	

bicolorous, with dark brown to black center with narrow whitish margin, comose from central point with 0.5–0.7 mm reddish brown hairs, margin entire; fronds distant, stipe ¼–⅙ of frond length, flattened, atropurpureous, scales bicolorous, round with comose center; blade irregularly pinnatifid, 4–7 cm long, 0.5–1.0 cm wide, linear-lanceolate, with acuminate tip; abaxial lamina with sparse fimbriate scales, some lanceolate (0.5–0.7 mm long), some round (0.1–0.3 mm diam.), with semi-clathrate center and tan to whitish tan margin; midrib dark with scattered lanceolate scales with dark sclerotic center; lateral veins obscure; adaxial lamina with sparse scales similar to abaxial scales except more deeply cut; soral scales

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FIG. 2. Hybrids of ×*Pleopodium* and *Pleopeltis* and their putative parents. A. *Pleopeltis crassinervata* (*Hallberg 1389*, NY, Oaxaca), habit. B–E. *Pleopeltis erythrolepis* (*Correll & Gentry 22975A*, NY, Chihuahua). B. Habit. C. Abaxial blade detail. D. Abaxial blade scale. E. Adaxial blade scale. F, G. ×*Pleopodium fallacissimum* (*Palmer 426*, NY, isotype). F. Habit. G. Abaxial blade scale. H–J. *Polypodium guttatum* (*Rzedowski 24040*, NY, Edo. Mexico). H. Habit. I. Abaxial blade detail. J. Abaxial blade scale. K. *Pleopeltis melanoneuron* (*Purpus 5798*, US, holotype), habit. L–O. *Pleopeltis astrolepis* (*Mickel 5165*, NY, Oaxaca). L. Habit. M. Abaxial blade scale. N. Abaxial blade detail. O. Rhizome scale. P–R. *Pleopeltis* ×*sordidula* (*Copeland 149*, US). P. Habit. Q. Stipe detail. R. Rhizome scale. S–U. *Pleopeltis fallax* (*Mickel 6468*, NY, Oaxaca). S. Habit. T. Abaxial blade detail. U. Abaxial blade scale.

TABLE 5. Comparison of *Pleopeltis* ×*sordidula* and its Parents.

	astrolepis	*sordidula*	*fallax*
Blade	simple	irregularly lobed	pinnate-pinnatifid to pinnate-bipinnatifid
Rhizome scales	bicolorous black center/pale brown margin	bicolorous black center/whitish margin	concolorous black
	ovate, 0.3–0.5 mm long	round, 0.1–0.3 mm diam.	round, 0.3–0.5 mm diam.
	comose	comose	comose
Stipe	short, flattened	short, slightly flattened	long, terete
Rachis scales	black sclerotic	brown with sclerotic center	clathrate
Laminar scales:			
Abaxial	scattered	sparse	sparse
	lanceolate (0.5–1 mm) to round (0.3–0.5 mm)	lanceolate (0.5–0.7 mm) to round (0.1–0.3 mm)	lanceolate (0.5–0.8 mm)
	bicolorous	bicolorous	concolorous
	dark brown center/pale brown margin	brown center/pale brown to whitish margin	brown
	non-clathrate	semiclathrate	clathrate
Adaxial	as abaxial	as abaxial	lacking
Sori	elongate	elongate	round
Spore size	44–51 μm (47.1)	38–45 μm (41.8)	37–45 μm (40.1)

extremely rare, round to lanceolate (0.3–0.5 mm long), dark brown to brown center, with light brown fimbriate margin; sori slightly oval; spores appearing normal.

Additional collections: Mexico. Veracruz: Río Blanco, 4800′, *Fisher 37* (US); Metlac [near Fortín de las Flores], 900 m, *Copeland 149* (US).

Polypodium sordidulum was based on three specimens from Veracruz. Maxon and Weatherby considered it "a local offshoot of *P. astrolepis*." They believed it to be similar to *P. astrolepis* except for the lobing, subterete stipe, and orbicular sori (although the figure shows them as oblong).

The type specimen and one of the two paratypes (*Fisher 37*) appear to represent the hybrid combination of *Pleopeltis astrolepis* × *Pl. fallax*; the other paratype (*Purpus 5798*) differs in several characters from this taxon. These differences, which may be due to its presumed origin as the hybrid of *Pleopeltis fallax* and *Pl. crassinervata*, will be discussed under the next hybrid.

Pleopeltis ×*sordidula* (see Table 5) has the irregularly lobed blade of a hybrid between a simple-bladed parent (*Pl. astrolepis*) and a more divided parent (*Pl. fallax*), with blade scale distribution (on both abaxial and adaxial surfaces, although the scales are sparse rather than scattered), and type (round and lanceolate rather than just lanceolate as in *Pl. fallax*) as in *Pl. astrolepis*, whereas coloration of the scales has characters of both parents (bicolorous as in *Pl. as-*

TABLE 6. Comparison of *Pleopeltis* ×*melanoneuron* and its Parents.

	crassinervata	*melanoneuron*	*fallax*
Blade	simple	irregularly lobed	pinnate-pinnatifid to pinnate-bipinnatifid
Rhizome scales	lanceolate 1–1.5 mm long bicolorous dark brown center/wide pale brown margin comose	lanceolate 0.5–0.8 mm long bicolorous dark brown to black center/narrow pale brown margin comose	round 0.3–0.5 mm diam. concolorous black comose
Rachis scales	non-comose lanceolate	non-comose lanceolate	comose round
Laminar scales:			
Abaxial	scattered lanceolate (0.8 mm long) and round (0.5 mm diam.) bicolorous brown center/pale brown margin	sparse lanceolate (0.5 mm long) and round (0.5 mm diam.) bicolorous brown center/pale brown margin	sparse lanceolate (0.3) 0.5–0.8 mm long concolorous clathrate
Adaxial	as abaxial	as abaxial	lacking
Lateral veins	dark, evident	dark, evident	obscure

trolepis, semiclathrate center as in the clathrate scales of *Pl. fallax*). The short, slightly flattened stipes are intermediate between the short, strongly flattened stipe of *Pl. astrolepis* and the terete stipe of *Pl. fallax*; the bicolorous rachis scales are also intermediate between its two parents.

Pleopeltis ×melanoneuron Mickel & Beitel, hybr. nov. (Fig. 2K).—TYPE: Mexico, Veracruz, Zacuapan, Jan 1912, *Purpus 5798* (US!; isotype UC).

Planta inter *Pleopeltim crassinervatam* et *P. fallacem* hybrida a parentibus frondium divisione rhizomatisque squamis intermedia differt et a *P.* ×*sordidula* nervis nigris laminaeque apice acuta abstat. (Gr., *melos*, black, and *neuron*, vein, referring to the dark secondary veins at the base of the blade.)

Rhizome creeping, 0.5–0.8 mm diam.; rhizome scales 0.5–0.8 mm long, lanceolate, with dark brown to black center and narrow pale brown margin, comose from central point with 0.5–0.8 mm reddish brown hairs, margin fimbriate; fronds distant; stipe ca. ¼ of frond length, round, atropurpureous; blade irregularly pinnatifid, 4.3–5.5 cm long, 1.0–1.8 cm wide, oblanceolate, with acute tip, lateral lobes with irregular teeth at tips; abaxial and adaxial surface with sparse fimbriate scales, some lanceolate (0.5 mm long), some round (0.1–0.3 mm diam.), with brown center and pale brown margin; midrib dark with scattered lanceolate scales, 0.8–1.0 mm long, similar in color to laminar scales, lateral veins evident, blackened, especially at base; soral scales extremely rare, peltate, 0.1 mm wide, light brown with fimbriate margin; sori slightly oval; reproductive status uncer-

tain, specimen with juvenile sporangia and mature sporangia open with no spores present.

Additional collection: Mexico, Veracruz, Altotonga, 1938, *M. B. Foster 14* (US!).

Discussion.—The type of *Pl.* ×*melanoneuron* was originally a paratype of *Polypodium sordidulum*. However, it differs in several characters that point to a separate origin as the hybrid of *Pleopeltis fallax* (Fig. 2S–U) and *Pl. crassinervata* (Fig. 2A) (see Table 6). It resembles *Pl.* ×*sordidula* in its irregular blade division and both lanceolate and round scales on the adaxial and abaxial laminar surfaces. The evident lateral veins, blackened at their bases, differ significantly from the obscure lateral veins of *Pl.* ×*sordidula* and point to *Pl. crassinervata*, with its black lateral veins, as its simple-bladed parent. The rhizome scales of *Pl.* ×*melanoneuron* are definitely lanceolate, bicolorous, and larger than those of *Pl.* ×*sordidula*, again pointing to *Pl. crassinervata* with its longer, lanceolate rhizome scales with wider pale margins than in *Pl. astrolepis*. The stipe in *Pl.* ×*sordidula* is flattened (from *Pl. astrolepis* with its strongly flattened stipe), whereas in *Pl.* ×*melanoneuron* the stipe is terete (since both *Pl. fallax* and *Pl. crassinervata* have terete stipes). The rachis scales in *Pl.* ×*melanoneuron* are lanceolate and non-comose (similar to *Pl. crassinervata*), whereas in *Pl.* ×*sordidula* they are round and comose (both *Pl. fallax* and *Pl. astrolepis* have comose rachis scales, round in the former and lanceolate and round in the latter). The oblanceolate blade of *Pl.* ×*melanoneuron* is acute at the apex and has scales with dark, non-clathrate centers, whereas *Pl.* ×*sordidula* has a linear-lanceolate blade with an acuminate apex and scales with dark, semiclathrate centers.

Acknowledgments

We thank Thomas Wendt, Michael Nee, and W. H. Wagner Jr. for useful discussions, and Rupert Barneby for his kind assistance with the Latin diagnoses. Figures 1A, B, F–H, M, N, 2A, L–N, S–U were drawn by H. Fukuda; the other figures and the plate layouts were prepared by Bobbi Angell. The drawings and publication were supported in part by the Joann Wolfe Ward Memorial Research Fund.

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1987 AIBS MEETING—CALL FOR PAPERS

The American Fern Society and the Botanical Society of America will meet with the American Institute of Biological Sciences at Ohio State University, Columbus, 9–13 August 1987. Members of the American Fern Society wishing to present a paper or poster may obtain abstract forms from the Program Chairman: Dr. Christopher H. Haufler, Department of Botany, University of Kansas, Lawrence, KS 66045.

A Fern Foray to the Hocking Hills will take place on Sunday, 9 August 1987. Cost: $21 per person, includes box lunch. Trip is limited to 45 people and will leave from the 12th Avenue (south side) of the Ohio Union at 8:00 a.m. and return at 6:00 p.m. The pteridophytes of the unglaciated areas south of Columbus will be studied in their natural habitat and will include especially those of the sandstone cliff faces and grottos. Hybrids will be seen in several genera: *Asplenium* ×*trudellii*, *Cystopteris* ×*wagneri*, and *Dryopteris* ×*neo-wherryi*, as well as the remarkable grotto gametophytes of *Vittaria* and *Trichomanes*. A number of threatened and endangered species on the Ohio list will be observed, but collecting of only common species will be permitted. Leaders are R. James Hickey, W. H. Wagner Jr., and Charles R. Werth. For more information, contact Wagner at (313) 764-1484.